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APPLICANTS	:	Liuyang YANG
SERIAL NO.	:	09/116,147
FILED	:	July 16, 1998
FOR	:	METHOD AND APPARATUS TO IMPROVE EFFICIENCY IN MULTIPLE-PASS, BIT-RATE-CONTROLLED FRAME ENCODING
GROUP ART UNIT	:	2613
EXAMINER	:	Y. Young LEE

M/S: APPEAL BRIEFS - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: M/S: APPEAL BRIEFS – PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, Attention: Board of Patent Appeals and Interferences, on

Dated: March 22, 2004

Barbara Vance
Signature

Barbara Vance

ATTENTION: Board of Patent Appeals and Interferences

APPELLANT'S BRIEF

Dear Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on January 21, 2004.

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1. REAL PARTY IN INTEREST

The real party in interest in this matter is Intel Corporation. (Recorded July 16, 1998; Reel/Frame 9322/0531).

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals.

3. STATUS OF THE CLAIMS

Claims 1-25 are pending in the application. Claims 1-25 were rejected under 35 U.S.C. §102(e) as being anticipated by Puri et al. U.S. Patent No. 6,148,026 (hereinafter "Puri").

4. STATUS OF AMENDMENTS

No claims were amended.

5. SUMMARY OF THE INVENTION

The present invention relates to encoding a frame of video image data with multiple encoding passes that are performed sequentially. Each encoding pass includes a number of executable steps and at least one of these executable steps includes a number of executable first order sub-steps. First order sub-steps in at least one of the encoding passes are identified as being necessary or unnecessary for execution of said encoding passes. The necessary sub-steps are executed during the encoding passes. At least one sub-step is excluded from execution during an encoding pass for which that sub-step is unnecessary.

Referring to Fig. 1, a general block diagram of an embodiment of the present invention is shown. In this embodiment, a camera 10 and a video capture component 11 are provided to generate a frame of video image data. Each frame of video data is provided to a video controller 12 which includes a bit rate controller 13. The uncompressed video frame data is sent to a video compressor 14 where it is compressed based upon a quantization parameter value (as described above) generated by a quantization parameter selector 15.

A block diagram of video compressor 14 is shown in Fig. 2. Uncompressed video image data is provided to an uncompressed data queue 22 and is then supplied to a codec 23 for the encoding operation. The encoding operation can be controlled by the quantization parameter selector 15 which may include a processor 20 coupled to a memory 21. The compressed video image data is transferred to a compressed data queue 24 and then to video controller 12 (Fig. 1).

An embodiment of the method of the present invention is shown in Fig. 4. In step 41, a review is made of the steps of a first encoding pass. In step 45, an identification is made of those steps that are necessary and those that are unnecessary for the first encoding pass. In decision block 47, it is determined whether there are any first order sub-steps to the steps in the first encoding pass. If there are, then control passes to step 51 for identification of first order sub-steps that are necessary or unnecessary for proper execution of the encoding pass. In this embodiment of the present invention, a step or sub-step can be identified as necessary by setting a flag associated with that set of code in a separate table, removal of that set of code from the system, etc. If there are no first order sub-steps to the steps in the first encoding pass, then control passes to decision block 49 to determine if there is an additional encoding pass to be performed (*e.g.*, a retrial encoding pass). If there is, then control passes to step 43 to move the analysis to the next encoding pass.

6. ISSUE

A. Are claims 1-25 anticipated under 35 U.S.C. §102(e) by Puri?

7. GROUPING OF CLAIMS

For the purpose of this appeal, the claims may be grouped as follows.

A. Claims 1-25

8. ARGUMENT

A. Claims 1-25 are not anticipated under 35 U.S.C. §102(e) by Puri

Independent claims 1, 7, 13, and 20 of the present invention describe encoding a frame of video image data with multiple encoding passes, excluding any sub-steps from a pass for which the sub-step is unnecessary. Claims 2-6, 8-12, 14-19, and 21-25, respectively, depend from and further define claims 1, 7, 13, and 20.

Claims 1-25 were rejected under 35 U.S.C. §102(e) as being anticipated by Puri. Puri generally discloses coding video data with enhanced functionality by coding video data as base layer data and enhancement layer data. (*See* Abstract). Appellants respectfully submit that Puri fails to disclose all the elements of claims 1, 7, 13, and 20, as amended.

Puri does not disclose excluding at least one sub-step from execution during an encoding pass for which that sub-step is unnecessary wherein at least first and second encoding passes of said video image data occur. In response to Appellant's contention that this element was missing from Puri, the Examiner cites the portion of Puri stating:

> In the second condition, a particular image may have been coded using too fine a mesh given the uses for which the VOP decoder 250 is decoding the data. That is, too many nodes may have been defined to encode the image. The controller 264 may cause the VOP encoder 210 to recode the image using fewer mesh nodes and, therefore, reduce the

channel bitrate. The third triggering event may be determined by user control input to the controller over line 268.

(*See* Puri, col. 5, lines 29-37).

The Examiner also cites this portion of Puri stating:

Where the decoder 400 operates in a mode that does not require mesh node encoding, the compositor 440 may command the encoder 300 to disable the mesh node encoding altogether.

(*See* Puri, col. 5, lines 29-37).

The Examiner combines these two passages to construct the element of the claims. Such a combination was not suggested by Puri and are meant to be separate actions in Puri. The first circumstance, in which data is recoded, involves encoding the data using a different set of parameters to create a smaller set of mesh nodes for transmission. No steps or sub-steps are excluded, merely the parameters and variables involved are changed. The second circumstance, in which mesh node encoding is disabled, disables the enhancement layer encoding of the data, leaving only the base layer encoding. No recoding is involved because the base layer is encoded separately, so no recoding is needed. Under Puri's scheme it would be highly inefficient to recode the data at this point. Therefore these two steps are not combined nor should they be. With this being the case, excluding at least one sub-step from execution during an encoding pass for which that sub-step is unnecessary wherein at least first and second encoding passes of said video image data occur is not shown by Puri.

In summary, it has been demonstrated that the Puri reference does not suggest the recited claim combination. Accordingly, a rejection of these claims under 35 U.S.C. §102(e) is improper. In view of the above, Appellants respectfully submit that the rejection of claims 1-25 should be reversed.

Appellants therefore respectfully request that the Board of Patent Appeals and Interferences reverse the Examiner's decision rejecting claims 1-19 and direct the Examiner to pass the case to issue.

The Examiner is hereby authorized to charge the appeal brief fee of **$330.00** and any additional fees which may be necessary for consideration of this paper to Kenyon & Kenyon Deposit Account No. **11-0600**.

Respectfully submitted,

KENYON & KENYON

Date: March 22, 2004

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APPENDIX

(Brief of Appellants Liuyang YANG
U.S. Patent Application Serial No. 09/116,147)

CLAIMS ON APPEAL

1. In a system for encoding a frame of video image data with at least first and second encoding passes of said video image data, where the second encoding pass on said frame of video data is performed after the first encoding pass is performed on said frame of video data and each encoding pass includes a number of executable steps and at least one of said executable steps includes a number of executable first order sub-steps, a method for encoding video image data comprising:

(a) identifying first order sub-steps in at least one of said first and second encoding passes as being necessary or unnecessary for execution of said encoding passes;

(b) executing said necessary sub-steps during said first and second encoding passes; and

(c) excluding at least one sub-step from execution during an encoding pass for which that sub-step is unnecessary.

2. The method of claim 1, wherein in said identifying step, all of said first order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

3. The method of claim 1, wherein at least one of said first order sub-steps includes a plurality of executable second order sub-steps, wherein after (a), said method further comprising:

(a_2) identifying second order sub-steps in at least one of said first and second encoding passes as being necessary or unnecessary for execution of said encoding passes.

4. The method of claim 3, wherein in (a_2), all of said second order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

5. The method of claim 3, wherein at least one of said executable first order sub-steps includes a plurality of n-1 order sub-steps and at least one of said n-1 order sub-steps includes a plurality of executable n order sub-steps where n is an integer greater than or equal to three, wherein after (a_2), said method further comprising:

(a_n) identifying n-1 order sub-steps in at least one of said first and second encoding passes as being necessary or unnecessary for execution of said encoding passes.

6. The method of claim 5, wherein in (a_n), all of said n order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

7. A set of instructions residing in a storage medium, said set of instructions capable of being executed by a processor to implement a method for encoding a frame of video image data with at least first and second encoding passes of said frame of video image data, where the second encoding pass on said frame of video data is performed after the first encoding pass is performed on said frame of video data and each encoding pass includes a number of executable steps and at least one of said executable steps includes a number of executable first order sub-steps, such that first order sub-steps in at least one of said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes, the method comprising:

(a) executing said necessary sub-steps during said first and second encoding passes; and

(b) excluding at least one sub-step from execution during an encoding pass for which that sub-step is unnecessary.

8. The set of instructions of claim 7, wherein in while identifying, all of said first order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

9. The set of instructions of claim 7, wherein at least one of said first order sub-steps includes a plurality of executable second order sub-steps, wherein second order sub-steps in at least one of said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

10. The set of instructions of claim 9, wherein all of said second order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

11. The set of instructions of claim 7, wherein at least one of said executable first order sub-steps includes a plurality of n-1 order sub-steps and at least one of said n-1 order sub-steps includes a plurality of executable n order sub-steps where n is greater than or equal to three, wherein n-1 order sub-steps in at least one of said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

12. The set of instructions of claim 11, wherein all of said n order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

13. A system for a frame of encoding video image data with at least first and second encoding passes of said frame of video image data, where the second encoding pass on said frame of video data is performed after the first encoding pass is performed on said frame of video data and each encoding pass includes a number of executable steps and at least one of said executable steps includes a number of executable first order sub-steps, said first order sub-steps in at least one of said first and second encoding passes being identified as necessary or unnecessary for execution of said encoding passes, said system including:

a video compressor adapted to encode video image data during said at least first and second encoding passes; and

a bit rate controller coupled to said video compressor and adapted to control said video compressor during said at least first and second encoding passes, such that said video compressor is adapted to execute said necessary sub-steps during said first and second encoding passes and exclude at least one sub-step from execution during an encoding pass for which that sub-step is unnecessary.

14. The system of claim 13, wherein said video compressor further comprises:

an encoder/decoder adapted to encode video image data during said at least first and second encoding passes.

15. The system of claim 14, wherein all of said first order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary.

16. The system of claim 15, wherein at least one of said first order sub-steps includes a plurality of executable second order sub-steps and said second order sub-steps are identified as necessary or unnecessary.

17. The system of claim 15, wherein all of said second order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary.

18. The system of claim 16, wherein at least one of said executable first order sub-steps includes a plurality of n-1 order sub-steps and at least one of said n-1 order sub-steps includes á plurality of executable n order sub-steps where n is an integer greater than or equal to three, and n-1 order sub-steps are identified in at least one of said first and second encoding passes as being necessary or unnecessary.19.

19. The system of claim 18, wherein all of said n order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary.

20. In a system for encoding a quantity of video image data with at least first and second encoding passes of said quantity of video image data, where the second encoding pass on said frame of video data is performed after the first encoding pass is performed on said quantity of video data and each encoding pass includes a number of executable steps and at least one of said

executable steps includes a number of executable first order sub-steps, a method for encoding video image data comprising:

(a) identifying first order sub-steps in at least one of said first and second encoding passes as being necessary or unnecessary for execution of said encoding passes;

(b) executing said necessary sub-steps during said first and second encoding passes; and

(c) excluding at least one sub-step from execution during an encoding pass for which that sub-step is unnecessary.

21. The method of claim 20, wherein in said identifying step, all of said first order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

22. The method of claim 20, wherein at least one of said first order sub-steps includes a plurality of executable second order sub-steps, wherein after (a), said method further comprising:

(a_2) identifying second order sub-steps in at least one of said first and second encoding passes as being necessary or unnecessary for execution of said encoding passes.

23. The method of claim 22, wherein in (a_2), all of said second order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.

24. The method of claim 22, wherein at least one of said executable first order sub-steps includes a plurality of n-1 order sub-steps and at least one of said n-1 order sub-steps includes a

plurality of executable n order sub-steps where n is an integer greater than or equal to three, wherein after (a_2), said method further comprising:

(a_n) identifying n-1 order sub-steps in at least one of said first and second encoding passes as being necessary or unnecessary for execution of said encoding passes.

25. The method of claim 24, wherein in (a_n), all of said n order sub-steps in said first and second encoding passes are identified as being necessary or unnecessary for execution of said encoding passes.